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DEVELOPMENTS IN COST ACCOUNTING

REPORT OF THE
COST ACCOUNTING SUB-COMMITTEE
of the
Taxation and Financial Relations Committee

GEE AND COMPANY (PUBLISHERS) LIMITED
27-28 BASINGHALL STREET, LONDON, E.C.2

FIRST PUBLISHED 1947
REPRINTED 1949
REPRINTED 1951
REPRINTED 1952

SET IN 10 PT. 'MONOTYPE' PLANTIN

Made and printed in Great Britain by
GEE AND COMPANY (PUBLISHERS) LIMITED, LONDON AND ST. ALBANS

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FOREWORD

by

GILBERT D. SHEPHERD, M.B.E., F.C.A.,
President of the Institute

There are probably few branches of accounting where genuine differences of opinion, often strongly held, give rise to so much controversy as cost accounting, and I consider it is an achievement of no small merit that the Taxation and Financial Relations Committee has been able to present to the Council a unanimous report from the Cost Accounting Sub-Committee. As the sub-committee states in the introduction to its report, no attempt has been made to prepare a comprehensive treatise on cost accounting. The report is largely intended to provoke further thought and development in a subject which has perhaps received too little attention from the profession in the past and yet is of rapidly growing importance to the whole country.

The Taxation and Financial Relations Committee of the Institute was set up in 1942, to assist the Council in an advisory capacity and to establish an effective liaison between the practising and the non-practising sides of the accountancy profession. Since its formation, the committee has acted as a drafting and advisory body to the Council and, in this way, has assisted the Council on questions of taxation, accounting principles, company law amendment and other matters. The activities of the committee are subject to the sanction of the Council and, hitherto, no publications arising from its work have been made in the name of the committee; in authorising the publication of the present book the Council has therefore departed from previous practice. The work of the committee in connection with accounting principles resulted in the issue of recommendations on accounting principles, carrying the authority of the Council itself. Those recommendations were issued with a view to giving a lead to members as to what is regarded as the best practice; they have undoubtedly been of the greatest assistance to members and have provided a means whereby members may support their own views with the weight of the Council's published opinion. This new book is in an entirely different category and the opinions expressed may not necessarily be those of the Council of the Institute.

The subject of cost accounting is a particularly extensive one; to a great extent it is still in its formative state and it would not be appropriate for the Council to attempt to lay down any hard and fast rules. At the same time, the Council feels that all members of the Institute should have the benefit of the valuable work of the Cost Accounting Sub-Committee. With the consent of the

members of the sub-committee, their names and the firms or companies with which they are connected are stated in the report, and it will be observed that the membership of the sub-committee is representative equally of industry and public accountancy. The sub-committee was first appointed as long ago as 1943; as we all know, the intervening years have been fraught with many difficulties, and for various reasons the progress of the sub-committee has been interrupted, but even so the length of time which has elapsed indicates the care which has gone into the preparation of the report. On behalf of the Council—and I feel sure the whole membership of the Institute will join with me—I wish to record my appreciation of this contribution to accounting literature. I think it is appropriate to add that the sub-committee's report has been considered by the full Taxation and Financial Relations Committee and has the approval of that committee, to whose members our thanks are also due.

The report is addressed primarily to the members of the Institute, whether engaged in industry or commerce, or in the practice of public accountancy. I hope, however, that it will be read with interest and benefit by many others. For those engaged in industry or commerce the report will enable them to review their own systems of cost accounting; whilst for those engaged in public accountancy it will provide an introduction to a subject that greatly merits their attention as being one which will play an increasingly important part in the framework of the future.

It is clearly not possible for all members who are in practice to undertake a specialised study of cost accounting, since it involves a detailed knowledge of the technical side of each particular business. Indeed, accountants, whether in practice or in industry, would be well advised to remember that in cost accounting it is essential for the details to be worked out in conjunction with the technical experts of each individual concern. Nevertheless, the Cost Accounting Sub-Committee has endeavoured to direct attention to certain general principles on which sound costing should be based, having in mind, particularly, some of the respects in which it considers cost accounting has proved inadequate or inefficient. It is my sincere hope that this book will receive the attention it so well deserves in the interests of the future development of cost accounting.

GILBERT D. SHEPHERD

June, 1947

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I. INTRODUCTION

(1) We were appointed by the Taxation and Financial Relations Committee with the following terms of reference from the Council of the Institute:—

> 'To consider from the accounting point of view the question of cost accounting generally, including the introduction of greater uniformity in costing methods, and to report.'

It is implicit in these terms of reference that our work should be of a general character, confined to main principles of general application. Accordingly, no attempt has been made to compile a text-book on cost accounting, or to deal in detail with the costing methods applicable to any particular industry.

(2) In the first instance we have referred briefly to the development of cost accounting as a branch of accounting, to the purposes for which costs are required, and to the defects we regard as inherent in much cost accounting practice. The remainder of our memorandum is devoted to consideration of principles which can be applied in order to remedy what we regard as five major defects worthy of serious thought.

(3) The importance of cost accounting has been emphasised during the war when cost investigations, made by the various supply departments in connection with war contracts, revealed widespread inadequacies in the costing records and methods of a major sector of industry. The increasing use of costing as a result of these wartime investigations has been of value in directing attention to a branch of accounting which hitherto has received too little attention from accountants generally. We would, however, emphasise that the cost accounting normally required in industry does not necessarily follow the methods based on price control required for government costing purposes. Industrial management is concerned with cost control rather than with questions of profitability in relation to 'capital employed'.

(4) It is in fact one of the most important conclusions we have reached that sound costing technique places the same emphasis on cost control as on cost ascertainment. We have therefore devoted a considerable part of our memorandum to the modern technique of 'standard costing', combined with 'budgetary control' of operating costs, a technique designed to provide at the same time the information required for both cost control and cost ascertainment. It is perhaps too commonly supposed that standard costing is applicable only to large businesses. Such is not the case. Standard costing is not an expensive method

of accounting and it is equally suitable for use in small businesses which do not employ a large accounting staff.

(5) The technique of standard costing, coupled with budgetary control, requires complete integration of cost and financial records, whereas cost accounting has developed largely as a separate operation, linked with the financial accounts by means of periodical reconciliations. Development along these lines arose from the fact that the traditional form of financial accounting did not lend itself easily to the purposes of cost accounting. We are, however, convinced that the integration of cost and financial records is not merely advisable but is essential if the future development of cost accounting is to satisfy the needs of management.

(6) Costs are used for many different purposes, and we cannot emphasise too strongly that it is the use that is to be made of the costs which should always determine their content. We have found it necessary to criticise methods of classification and treatment of certain elements of costs, particularly in connection with the allocation of overhead expense. Our criticisms in this respect are particularly relevant to the fundamental principle which we have emphasised above, namely, that the content of any cost must be determined by the use to which that cost is to be put. A cost has no value in itself and unless it is compiled in such a manner as will enable the management to take appropriate action, the accounting department will have failed to make its proper contribution to the business.

(7) Our terms of reference specifically include the question of the introduction of greater uniformity in costing methods. Even before the war there was a noticeable tendency for firms engaged in the same industry to pool a considerable amount of information through their trade associations so that informative statistics might be prepared upon which to base trade policy. Current trends in both national and international trade policy have created problems of considerable perplexity for those concerned with industrial management, and it seems probable that the tendency to pool information will increase. Such pooling implies a considerable measure of uniformity in cost accounting in the various concerns comprising a particular industry; a measure of uniformity which cannot be achieved without much thought and research by the accountancy profession.

(8) Owing to the great variety in design of what is basically the same product in any one industry, comparative statements showing costs per article do not provide by any means the whole of

the information required by management in its attempt to achieve a greater degree of manufacturing efficiency. In spite of this variety, however, the majority of the processes through which the articles pass are essentially similar and comparable. In our opinion, therefore, a properly conceived system of uniform cost accounting for a particular industry should be designed, where possible, to show the comparative costs per unit of output for operating like processes.

(9) A concise summary of our main conclusions appears on page 47, but we have indicated in the foregoing remarks the general nature of the result of our examination of cost accounting methods. In view of the attention we have drawn to standard costing and to uniformity, it is interesting to observe that under the Industrial Organisation Bill one of the functions of the proposed development councils is the duty of—

> 'promoting the improvement of accounting and costing practice and uniformity therein, including in particular the formulation of standard costings'.

Our subject is thus not one in which the accountancy profession alone is interested. Costs are provided for the use of managements, in relation to both their own particular concerns and their place within an industry as a whole. It is therefore not unnatural that those responsible for industrial effort should seek improved methods of securing information vital to the day-to-day conduct of industry. It rests with the accountancy profession to apply the weight of its experience and skill in providing the required information.

(10) We are conscious of the limitations of our memorandum. We have not attempted to prepare a comprehensive treatise and so far as possible we have stated our points with brevity, almost in the form of notes. Our endeavour has been to state shortly the main principles as we see them. We do not expect that every member of the Institute will necessarily agree with all our conclusions. Nor do we consider that we have done more than prepare the way to further and intense study. We trust, however, that some of our thoughts and observations will be of use to members and will serve the purpose of stimulating thought in the profession on what is admittedly a complex but extremely interesting and vitally important subject.

II. GENERAL CONSIDERATIONS

Accounting development

(11) In its historical development, accounting emerged as a means whereby the profit or loss of a business enterprise for successive periods might be displayed in a single figure. It was inherent in this traditional conception of accounting that expenditure analysis should be concentrated on depicting the total expense incurred in relation to groups of individuals and external factors—e.g. the total disbursements to suppliers on account of purchases, the total cost of wages paid to workpeople, and the total expenditure incurred on rent, rates and insurance of premises.

(12) With the growth in the size of business enterprises and increased competition, it has become necessary to pay close attention not only to the total results of a business but also to the question of whether its management has achieved, and is continuing to achieve, maximum efficiency at every stage of the industrial process. The accountant thus finds himself confronted with the necessity for extending the analysis of traditional accounting so as to disclose the operating costs of individual processes, departments or activities; and, further, to do this with such promptitude and clarity that the management may be enabled to discover and rectify any errors or inefficiencies with the minimum of delay.

(13) If an accounting system is to fulfil efficiently all the various demands made on it, including that of providing accurate cost information by process and by product, it must be so devised that the information required for every purpose is made readily available to management. At the same time, care must be exercised to avoid over-elaboration, resulting in unnecessary expense, and the production of costing statements in a mechanical manner without regard to whether or not they are or can be used by management.

(14) The steps in the development of accounting as an instrument of management may be summarised briefly as follows:

(*a*) *Financial accounting.* The ascertainment of total results analysed in relation to external factors and groups of individuals.

(*b*) *Cost ascertainment.* The allocation of expenditure to specific activities, processes or products.

(*c*) *Budgeting.* The planning and controlling of the whole of the financial activities of an enterprise.

(*d*) *Standard costing.* The utilisation of the whole accounting technique to locate errors and inefficiencies at the source, by setting up standards as a basis for judging actual operating performance.

Budgeting and standard costing evolved independently but contemporaneously and, with the added refinement of flexible budgeting, are now coming to be welded together into the most effective instrument of cost control yet available to management.

The use to be made of costs

(15) Costs may be required for many different purposes at different times and they have to be assembled for each purpose in appropriate combinations. In so far as the same kind of costs are required repeatedly, their collection can be treated methodically.

(16) A cost can only be a convention; and the expression 'an accurate cost' can have meaning only within the particular convention chosen as appropriate to the purpose for which the cost is required. Failure to appreciate this is a common cause of misunderstanding.

(17) We cannot emphasise too strongly that it is the use to be made of the cost that should determine the particular convention within which the cost is prepared. If those whose task it is to prepare costs do so with a different notion as to the use to be made of them from those who in fact make use of them, then the costs may be not only useless, but positively harmful. Costs have no usefulness in themselves; their value depends wholly upon the action which management is able to take in the light of the information they reveal.

(18) For example, selling and distribution expenses are incurred for the purpose of selling the product. In determining a cost of the product for stock valuation, it would not be appropriate to include such expenses as part of that cost; on the other hand, in arriving at a cost for the purpose of determining a selling price, selling and distribution expenses would undoubtedly be a material factor to be taken into account.

(19) Individual items of expense—advertising for instance—may be unsuitable for inclusion in a cost arrived at for the purpose of deciding whether it is cheaper to buy a product ready-made or to manufacture it, although the inclusion of such an item may be most desirable in comparing the profitability of a nationally advertised product with that of one sold without any specialised publicity.

(20) There are other matters, besides the inclusion or exclusion of specific items of expense, which require consideration in relation to the various uses that can be made of costs—such as the basis on which overhead expense should be allocated and whether the cost should look backwards to past facts or also forward to the probabilities. All such problems require to be reviewed in the light of the use which is to be made of the costs. No cost should ever be assembled without due consideration being given to the purpose for which it is required, so that the individual

items included and the basis on which they are included may be appropriate to that purpose. Furthermore, those who propose to take action based on cost information should understand exactly what conventions have been used in the compilation of such information.

Past defects and their remedies

(21) Modern developments in costing can be traced to the need for correcting some specific defect or inadequacy in earlier practice, and it appears that the best way to explain these developments is to deal in separate sections with the nature of the earlier defects and the remedies which have been devised to correct or mitigate them. The present memorandum is therefore framed according to that plan.

(22) The following are five of the most important respects in which costing has, in the past, proved to be defective or inadequate:

(*a*) In many instances costing has not been based, or has not been adequately based, on data furnished by proved accounting processes. There has been misconception of the relation between costing and accounting, resulting in a failure to make proper use of the latter as an essential basis for costing. (Section III.)

(*b*) In many cases the inclusion of overhead expense in costs has been effected on imperfect and even misleading bases, not scientifically thought out and not subjected to revision from time to time as conditions have changed. (Section V.)

(*c*) In particular, total costs have sometimes been compiled without proper regard to the distinction between fixed and variable expense; this has given managements an incomplete and even faulty impression of the facts, leading in some cases to inappropriate action. (Section VI.)

(*d*) The usefulness of costing has often been diminished by a purely historical basis of presentation which has overlooked the value of comparing the results actually achieved with what they should have been if conditions and performance had been more nearly in accordance with expectations. In general, there has been insufficient use of the standard costing technique, whereby variations from the normal may be detected at the source and analysed to their causes. (Section VII.)

(*e*) Lack of uniformity in costing methods as between individual firms within given industries has sometimes falsely suggested that given selling prices are profitable for one business and unprofitable for another; and the consequent development of price-cutting conditions has led to the existence of prices uneconomic for the industry as a whole.

Lack of uniformity has also tended to react against trade interests because it denies to all parties the benefits to be obtained from the making of true comparisons. (Section VIII.)

In the following sections each of the five matters briefly mentioned above is dealt with separately in greater detail.

III. ORGANISATION OF ACCOUNTANCY FUNCTION

Integration of cost and financial records

(23) The term 'cost' may be said to be the total valuation of all expenditure incurred in connection with a specific activity such as the production of products or the provision of services.

(24) Cost accounting may be described as that part of the accounting system of an organisation which is devoted to ascertaining, in as precise a manner as possible, the cost of a particular process, batch, job, service or unit of industrial activity—not as an end in itself but as a means of controlling all the factors which influence cost.

(25) In view of the emphasis which came to be placed on cost control as a main purpose of cost accounting and of the fact that the traditional form of financial accounting was not designed for this purpose, there arose a tendency for manufacturing concerns to develop their cost records independently of the main accounting records.

(26) The assumption was made, incorrectly in our view, that the cost department could safely produce costs of products, manufacturing operations, or services, on the basis of information drawn only from production records—except in so far as it was necessary to obtain certain financial data relating to overhead expense from the main accounts department—and to attempt an over-all reconciliation later. This division of responsibility is not only unnecessary but dangerous; for there is a risk of substantial errors arising which may well lead to the production of incorrect information of a character seriously misleading to management.

(27) We consider it fundamental that there should be complete integration between cost and financial records not only for the purpose of cost control but also for the purpose of cost ascertainment. In order to achieve such an integration it is necessary that an all-embracing accounting scheme should be planned in relation to which accounting records can be developed for all purposes, both financial and costing.

(28) The financial accounts and cost accounts of an organisation should be regarded as but two parts of one whole; both utilise the same basic information although in different ways. In our opinion, the chief accounting executive of any organisation should be responsible for seeing that all sections of the accounting organisation contribute to the common end; that redundancies and unnecessary operations are eliminated; that information is brought forward promptly and reflected accurately; and that, in short, financial accounting and costing are so keyed together

that they contribute, each in its proper sphere, towards the common objective.

Where a business operates a branch under the control of a local manager or director, the accounting staff of the branch must inevitably come under the disciplinary control of that manager or director. The branch accounting staff, however, should be under the sole control of the chief accountant at head office so far as the principles of accounting are concerned. Only thus can complete integration of the accounts of the whole organisation be ensured. (29)

Purposes of cost accounting

In devising a cost accounting scheme the purposes it is desired to fulfil must be kept clearly in mind. These purposes are as follows: (30)

(*a*) *To control expenditure*

The most essential purpose of cost accounting is that of providing accurate and prompt information and cost data in order that management may be placed in a position to control cost per unit of output for all elements of cost, both direct and overhead expense. Such control implies the promotion of efficiency, e.g. in the usage of labour, materials and machines by providing management with appropriate information as to production per man- or machine-hour, idle man- or machine-hours, material consumption, wastage, rejects, and special losses or gains peculiar to the industry, such as those due to humidity. Competition establishes selling prices to a large degree, and the profit-earning capacity of a particular organisation may be influenced materially by the efficiency with which costs are controlled.*

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*It must be pointed out that this does not mean that sound methods of cost control are to be used in such a manner as to effect a reduction in wage rates. This point is aptly illustrated by the following cost statistics prepared by Mr. C. E. Headlee, Director of Industrial Accounts to the Westinghouse Electric Corporation of America.

CHANGE IN ELEMENTS OF COST FOR REPRESENTATIVE ELECTRIC PRODUCT FROM 1914 TO 1944

Year	*Hourly rate paid* %	*Direct labour cost* %	*Material cost per pound* %	*Direct material cost* %	*Indirect manufacturing expense* %	*Total factory cost* %	*Price* %
1914	100	100	100	100	100	100	100
1920	245	163	208	228	188	197	192
1925	240	138	137	155	156	151	104
1930	236	117	124	96	117	106	100
1937	292	90	134	81	103	90	106
1940	302	86	127	81	102	88	99
1944	433	97	130	86	119	98	94

These statistics show that, although the price of the product concerned

(*Continued overleaf*)

(b) To provide a basis for estimates and cost ascertainment

The second main purpose of cost accounting is to provide:

(i) a basis for estimating;

(ii) information enabling the accuracy of all estimates to be checked;

—in other words, the dual function of cost estimation and ascertainment.

(c) To provide a basis for operating policy

The third main purpose of cost accounting is to provide management with a basis of operating policy, particularly where the products manufactured in the same factory are diverse in character. In this connection, it is of particular importance to management to know the marginal costs of products handled—by which we mean the total costs excluding fixed overhead expense, or in other words, every expense (whether of production, selling or distribution) incurred by the taking of a particular decision. Such information enables decisions to be taken as to:

(i) whether to manufacture equipment, components, or products, or to buy outside;

(ii) what are, in times of trade depression or surplus manufacturing capacity, the lowest economic prices which can be quoted for certain products in order that the highest contribution to fixed overhead expense may be achieved.

This involves the calculation of what is now commonly referred to as the 'break-even point' of a business by relating the gross margin percentage of sales to the amount of fixed overhead expense. (Figure 1.)

Costing records and information

(31) In order to achieve these purposes the cost department in conjunction with the technical experts and departmental heads, should be in a position to:

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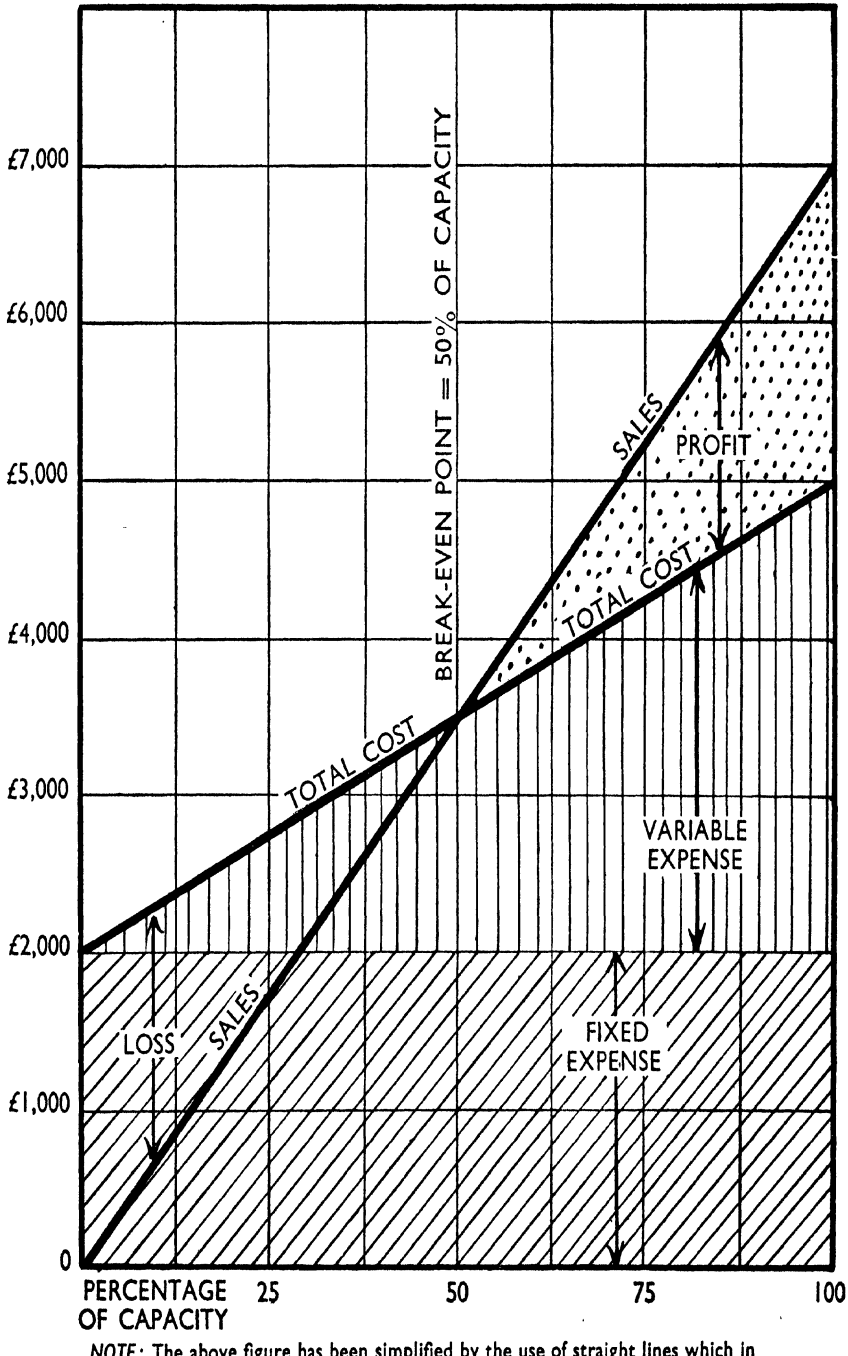
rose from 100% in 1914 to 192% in 1920 it has fallen back since that date to 94% of the 1914 price in spite of the fact that the hourly rate of wages paid has consistently risen, with the exception of declines in 1925 and 1930, from 100% to 433% of 1914 rates. The explanation for the low product cost, despite the increased cost of wages, lies in the economies which have been achieved in material utilisation and the reduced cost of labour per unit manufactured. Indirect manufacturing expense, it will be observed, rose from 100% in 1914 to 188% in 1920, but then declined until in 1944 it amounted to 119% of the 1914 figure.

Mr. Headlee attributed part of the cost reduction to an increased volume of production and sales, but a more substantial saving resulted from improved manufacturing processes and techniques.

Figure 1

BREAK-EVEN CHART



NOTE: The above figure has been simplified by the use of straight lines which in practice would be curved.

(*a*) maintain suitable records and appliances (e.g. meters and weighbridges) controlling the quantity and value of materials entering into manufacture and of finished products;

(*b*) maintain a sound system of recording and analysing both direct and indirect labour by process and/or product;

(*c*) maintain suitable records for the control of all overhead expense so that it may be allocated as accurately as possible to all cost-centres and ultimately to the products manufactured;

(*d*) produce cost information for all elements of cost entering into each product manufactured at normal levels of factory activity and efficiency;

(*e*) prepare and present promptly to management all essential data in relation to the operation of manufacturing processes.

(32) In addition, each factory will have its own requirements of statistical information; and generally speaking, regardless of the costing methods used, the following statements should be made available to managements:

(*a*) A statement of overhead expense incurred showing methods of allocation to particular cost-centres and products.

(*b*) A statement showing the productive output per worker by process.

(*c*) A statement of wages paid by process in relation to output achieved.

(*d*) Stock analyses.

(*e*) Analyses of idle time, spoiled work and other special manufacturing losses.

(*f*) Analyses of machine performances, showing running and idle time, causes of idleness and breakdowns, length of runs, and output.

(*g*) A statement of sales analysed by product, territory or otherwise—showing profit or loss.

(*h*) Classified statement of orders received and on hand.

(33) An essential device in any fully integrated accounting scheme is a carefully devised code or chart of accounts, so that all transactions on origination are immediately coded and classified to indicate their nature and place in the financial or cost records. (Figure 2.)

(34) It is important that, in formulating the principles underlying all accounting activities, due weight should be given to each of the following considerations:

CODE OR CHART OF ACCOUNTS

There are many methods of drawing up a code or chart of accounts. One method is as follows:

1. All account numbers contain three figures.

2. The accounts are used for analysis to cost-centres and the same account number may appear in each cost-centre with a prefix denoting the cost-centre.

3. The groups of account numbers are:

	Group	*Numbers*
Capital and nominal accounts	000	001—099
Raw materials stock accounts	100	100—149
Bought-out parts stock accounts	150	150—199
Consumable stores stock accounts	200	200—249
Work-in-progress accounts	250	250—299
Finished-stock accounts	300	300—349
Control accounts	350	350—399
Works expense accounts	400	400—499
Selling and administration expense accounts	500	500—599
Variance accounts	600	600—699
Cost of sales accounts	700	700—749
Sales accounts	750	750—799

4. It should be noted that the 100, 150 and 200 series are for materials and stores bought for stock. These will be taken from stock by means of requisitions and charged to the appropriate expense accounts.

5. Certain expense accounts, such as travelling and postages, are made up partly of the expense incurred at the factory and partly of charges made by head office. In such cases the same expense account appears in the 400 group and in the 500 group, the last two digits of the account number being the same in each group, e.g.:

469 and 569 Telegrams and postages.

480 and 580 Travelling expenses.

The factory expense proportion of the account is charged into the 400 group account, and the head office charge to the 500 group account.

(*a*) The financial accounts measure total profit or loss and the financial condition of an undertaking as it varies from time to time. The general principles of accounting govern these records and legal considerations control the degree of disclosure that must be practised. The integrity and the reliability of the records from the point of view of the prevention and discovery of error or fraud, are important considerations under this head.

(*b*) A business does not run itself but demands continual direction and control. It is therefore highly important that data is provided regularly and promptly which can confidently be accepted and used by management for this purpose.

(*c*) Cost accounting is concerned with selection of data for given purposes and with the analysis of expense to products, processes or activities. It has already been emphasised that this branch should not act in isolation but should be regarded as an integral part of the general accounting organisation.

(*d*) Not all of the items of information requisite to good management are capable of being expressed in terms of money, e.g. quantities of goods, numbers employed, hours worked, production per man or per hour, output per machine. These items are the subject-matter of statistics of which the source will be found in records falling within the province of the accountant, but which require the skill of technicians (e.g. engineers and time and motion study experts) in conjunction with departmental managers.

(35) An accounting scheme comprehensively designed, understood and used, has potentialities not always fully realised. For example, with the increasing scale on which industry is now being conducted, management has to rely on the delegation of responsibility. The accounting system should therefore be designed in such a way that every item of expense is allocated to the departmental or sectional heads within whose power it is to control the amount of that expense. In this way, increases of cost will be 'charged to the account' of those to whom responsibility has been delegated. We have prepared a diagram (Figure 3) showing examples of statements to be provided at all levels of management.

(36) One feature of management, which is of increasing importance, is the necessity of forecasting the course of business and of planning expenditure in relation to that forecast; thereafter the development of events is watched with a view to correcting errors and inefficiencies as they appear. This comparison of income and expenditure with forecast, or 'budgetary control' as

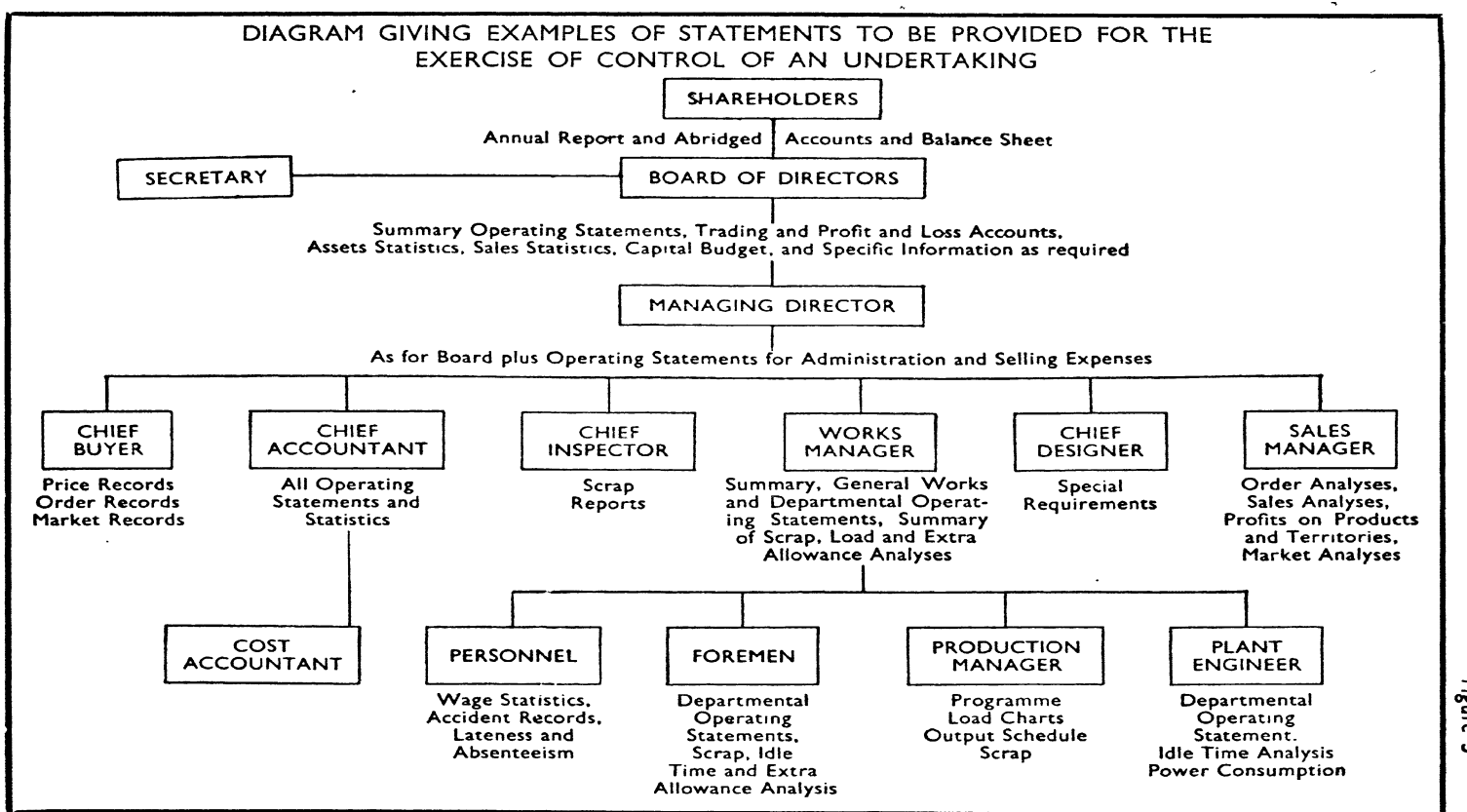


DIAGRAM GIVING EXAMPLES OF STATEMENTS TO BE PROVIDED FOR THE EXERCISE OF CONTROL OF AN UNDERTAKING
SHAREHOLDERS
Annual Report and Abridged Accounts and Balance Sheet
SECRETARY
BOARD OF DIRECTORS
Summary Operating Statements, Trading and Profit and Loss Accounts, Assets Statistics, Sales Statistics, Capital Budget, and Specific Information as required
MANAGING DIRECTOR
As for Board plus Operating Statements for Administration and Selling Expenses
CHIEF BUYER
Price Records Order Records Market Records
CHIEF ACCOUNTANT
All Operating Statements and Statistics
CHIEF INSPECTOR
Scrap Reports
WORKS MANAGER
Summary, General Works and Departmental Operating Statements, Summary of Scrap, Load and Extra Allowance Analyses
CHIEF DESIGNER
Special Requirements
SALES MANAGER
Order Analyses, Sales Analyses, Profits on Products and Territories, Market Analyses
COST ACCOUNTANT
PERSONNEL
Wage Statistics, Accident Records, Lateness and Absenteeism
FOREMEN
Departmental Operating Statements, Scrap, Idle Time and Extra Allowance Analysis
PRODUCTION MANAGER
Programme Load Charts Output Schedule Scrap
PLANT ENGINEER
Departmental Operating Statement. Idle Time Analysis Power Consumption

Figure 3

it is called, depends on the existence of accurate and reliable accounting records. The forecast itself is the responsibility of management but, in so far as it is based on past data before being adjusted to allow for future variations, it is usual to rely on the accounting department of an organisation for a great part of the necessary information.

(37) Without such forecasts it is impossible to correlate the activities of the various sections of a large manufacturing concern. The sales forecasts or budgets usually constitute the basis for manufacturing policy and production planning, which in turn provide a basis for forecasting plant, labour and material requirements. Budgeting is indeed the basis for all intelligent action by the main divisions of a business—e.g. buying, production, sales, finance, technical and research, and personnel.

Conclusions

(38) To summarise the foregoing remarks, it can be said that an accounting system should be regarded as a whole, embracing all financial, cost and operating records. It should be devised with the paramount intention of focusing attention on all factors contributing to good management and efficient operation. Every aspect of the financial and cost records of a business should be treated with a due sense of its relation to the whole; defective treatment or neglect of any one part will diminish the services which accounting is able, when properly conducted, to render to the business of which it is the servant.

IV. ELEMENTS OF COST

(39) The elements of cost entering into manufacture and other business operations are:

Direct expense

(*a*) materials

(*b*) labour

(*c*) operating expenses

Overhead expense

(*d*) factory

(*e*) warehouse and packing

(*f*) selling and distribution

(*g*) research and development

(*h*) general administration.

(40) Difficulties of principle do not ordinarily arise in connection with (*a*) which represents the materials going into the finished product; or (*b*) which represents the labour directly employed in converting the materials into the finished product; or (*c*) which represents expenses directly incurred for, and therefore chargeable against, a particular process or product. Given a sound system of material control, all direct material (whether raw material, or bought-out finished or partly-finished material) is necessarily accounted for in computing the cost of the individual parts entering into the composition or assembly of the finished product; and it is a matter of accurate accounting analysis to ensure that all direct labour and direct expense are included when calculating the cost of a particular process, job or unit. Whilst many problems may arise in practice in connection with direct expense, they are usually matters of the accounting machinery necessary to ensure that all direct expense is properly allocated to its appropriate product or process. These are problems peculiar to particular industries and therefore outside the scope of our memorandum.

(41) On the other hand, every business incurs expenses which are termed 'overhead' in the sense that it is not possible to associate them directly with any given product or productive process; it is therefore necessary to find a means of distributing them over the total production on a basis that will load each unit or process with an equitable share. The real problem, with which the next two sections are concerned, is to decide what is equitable.

V. OVERHEAD EXPENSE

(42) Overhead expense, as indicated in the previous section, may be divided into the following classes:

(*a*) factory
(*b*) warehouse and packing
(*c*) selling and distribution
(*d*) research and development
(*e*) general administration.

(43) A careful allocation of overhead expense is usually fraught with considerable technical and accounting difficulties, and the problems that arise require careful consideration in each case if reliable cost information is to be produced. Owing to the difficulties and complications of the subject, arbitrary and short-cut methods are too commonly used. Such methods cannot produce reliable information—in spite of the appearance of meticulous accuracy with which the reported results are often clothed—and serious errors may be made if such figures are used as a basis for deciding matters of policy.

Arbitrary methods of allocating overhead expense

(44) It has not been uncommon to find all overhead expense combined into one total and this total distributed by means of a uniform percentage on direct labour. In cases where a variety of products is made, this has resulted in certain products being over-charged and others under-charged with overhead expense. In recent years the tendency to introduce complex process machinery which in many cases can be operated by relatively cheap labour, has considerably increased the incidence of overhead cost per unit of output. It is imperative, therefore, that overhead expense should be apportioned with a high degree of accuracy in order to ensure that different products carry their due share. Cost information which disregards this factor may in consequence lead to the adoption of an unsound sales policy.

(45) The total of overhead expense to be included in costs is often based on the expenditure of a preceding accounting period whereas the actual expense being incurred during the period of manufacture may vary considerably from that past expenditure.

(46) Similarly, the rate at which overhead expense is applied to product costs is frequently calculated by reference to the volume of output in a preceding accounting period. The volume of output between different periods may vary considerably and an ill-considered basis of allocation may therefore result in serious errors in

costing. A change of volume plays tricks with the incidence of overhead expense. For example, if a year of active trade is followed by a year of low activity, the percentage of factory overhead expense on output might increase from, say, 100 per cent. to 200 per cent. It is impossible, however, to justify valuing an identical item of stock at the beginning of the year on the 100 per cent. basis and at the end of the year on the 200 per cent. basis. Yet that is not unknown in practice, in spite of the obvious fact that it produces a paper 'profit' of an entirely illusory character. The increase in the overhead expense rate during a period of low factory activity is more properly regarded as a cost of loss of volume (or a 'volume variance') and indicates the proportion of overhead expense not recovered owing to under-employed capacity. In Section VII we show how management can be supplied with information disclosing in financial terms the cost of this volume variance or under-employed capacity.

(47) A method of allocation suitable for factory overhead expense will probably not be suitable for the other classes, which have no direct relationship with manufacturing time or labour effort. For example:

warehouse and packing overhead expense depends on the type, size, weight and destination of the product;

selling and distribution overhead expense depends on the type of product, the sales channels used and the location of the customer. Export sales attract special charges for packing, freight, duty and landing charges;

general administration overhead expense cannot be directly identified with any particular product or activity. A basis different from those suitable for the other classes is therefore needed.

Correct allocation of overhead expense

(48) The problem of correct overhead expense allocation falls into two parts:

(i) the estimation in advance, for each individual process or service, of the overhead expense for the current period of manufacture;

(ii) the distribution of these expense totals to individual products.

Estimation of overhead expense

(49) It is first necessary to allocate each item of overhead expense to the process, service or function to which it is applicable and in respect of which it is incurred. The extent to which analysis and subdivision should be carried is determined by the organisa-

tion structure of the business and by the variety of processes carried on; a separate subdivision of the accounts should be set up wherever a different foreman or superintendent is responsible for the expense incurred, or wherever a different rate of process overhead cost per hour is likely to arise. A department may be, for example, a shop where only one type of production is carried out, in which event the department is physically distinguishable. If, on the other hand, in a particular shop, two different types of production are carried out, e.g. one being a mechanical conveyor process and the other manual work, the shop should be separated, for costing purposes, into two 'cost-centres'.

(50) In addition to cost-centres, there are also service departments, such as:

(1) Engineering and maintenance.
(2) Power.
(3) Raw material storekeeping.
(4) Tool storekeeping.
(5) Welfare.
(6) Watchmen, cleaners and general labour.
(7) Fire brigade.
(8) Works accounting.
(9) Wages office.
(10) Research and technical.
(11) Inspection and testing.
(12) Time and motion study.

Practice varies in regard to service departments. In some cases overhead expense is allocated first to service departments, the costs of which are subsequently allocated to cost-centres; whilst in other cases it is found more convenient to allocate direct to cost-centres.

(51) The subdivision of the accounts must recognise that apart from purely costing purposes, departmental accounts and costs are used by management to measure departmental efficiency. To this end, it is clearly necessary to classify separately all expense for which a departmental manager or foreman is directly responsible, so that he may be judged solely upon the operating results and expense which lie within his control.

(52) The bases on which individual items of overhead expense should be allocated to cost-centres and service departments, will depend on the circumstances of each case and it would be dangerous to attempt to lay down rules of universal application. The following suggestions are to be regarded as illustrative only:

(*a*) The method of 'direct charge' may well be applied to such items as departmental supervision, plant maintenance, departmental general labour, plant depreciation and mechanical power. (*Note.*—Where power is not metered, horse-power hours may control the allocation.)

(*b*) Cubic capacity is often a reasonable basis for such items as depreciation and maintenance of buildings and their heating. Lighting, on the other hand, depends on the number of light points or, more accurately, on the wattage, unless the consumption is metered.

(*c*) Floor space may govern such matters as rent (or annual value of premises owned) and rates.

(*d*) The number of employees will generally be the deciding factor for the cost of the wages office and of the welfare organisation.

(*e*) The insured value of property is a convenient basis for fire insurance charges.

(*f*) General services for which there is no other basis will be spread according to the best estimate of utilisation that can be made.

(53) Having settled the allocation of overhead expense, the next step is to estimate, or budget, all overhead expense for the current manufacturing period in such a way as to maintain precisely the same subdivisions of expense as have been adopted for the accounts. All these estimates or budgets should, of course, be built up from the records of past accounting periods, adjusted to provide for variations anticipated during the current period.

(54) In this way, two advantages have been gained. Overhead expense has not been treated *en bloc*; the correct amount has been charged to every single process or cost-centre. The figures to be included in costs are not those of a past period but represent the closest possible estimate of what they are likely to be in the current period. The estimates should subsequently be compared with the actual expenditure when ascertained, so that the cost variations may be disclosed promptly to management.

(55) When preparing the detailed budget figures, overhead expense should be divided into 'fixed', 'variable' and, if necessary, 'semi-variable' (Section VI). The distinction between these groups should be maintained throughout the cost records, e.g. when services or partly-manufactured products are charged on to other departments the make-up of the transfer charges should be shown, so that the final cost may show the total overhead expense subdivided into fixed, variable and, if necessary, semi-variable.

Distribution of overhead expense to product costs

(56) It is now necessary to consider how the budgeted overhead expense may best be distributed to individual products.

(57) In the first place, where the overhead expense of service departments is allocated to those departments, the budgeted expense for each service must be transferred to cost-centres, otherwise it will not be possible to ensure that they enter into the costs of individual products. While it is unwise to lay down any hard and fast rules, this can often be done along lines similar to those followed in the case of individual items of expense (see paragraph (52)), e.g. insurable value of buildings in respect of the fire prevention service, metered power or horse-power hours consumed in respect of the power house, number of employees as a basis of apportionment for cost of works welfare department and wages office. But if these are inappropriate, the problem of allocating the expense of service departments to productive processes on an equitable basis must be solved with skill and judgment.

(58) Having ensured that all overhead expense has been accounted for so that the total is spread over cost-centres only, the next step is to devise a logical basis for apportioning overhead expense to the individual products which pass through these cost-centres in the course of manufacture.

(59) There must always be some conflict of opinion as to the most suitable factor or combination of factors for achieving the desired object, but generally speaking it would appear that the budgeted overhead expense for each cost-centre should be apportioned to product costs on the basis of the time for which any one product or part of a product should occupy the particular cost-centre concerned. Experience shows that process-time is often the main link between expense and product; and if the expense of a cost-centre during a given period is known, then the expense can be expressed as a given sum per hour of production or process time. In fact, most industrial processes yield to the time basis of apportionment but in certain cases (e.g. transport) weight and distance are involved, and in others (e.g. pottery kilns) space displacement is a factor to be taken into account.

(60) Whichever factor or combination of factors is adopted, the overhead expense rate should be calculated by reference to the normal time taken, space occupied, or other factor, so that if the actual is greater than the normal, the cost of inefficient operation or loading can be revealed in terms of the overhead expense under-recovered.

(61) In practice, the methods most commonly used for distributing overhead expense to product costs are as follows:

(*a*) by a percentage of direct labour cost;

(*b*) by a man-hour rate, computed by dividing the budgeted departmental overhead expense by the normal total direct labour hours;

(*c*) by a machine-hour rate, computed by dividing the budgeted expense of operating and maintaining a particular machine or class of machine by the normal number of machine hours expected to be run;

(*d*) where production is not diverse but confined to a standard product, by standard rates per unit of product, computed by dividing the budgeted overhead expense by the normal production in pounds, feet, barrels or other unit of production.

(62) The 'percentage of direct labour cost' method of overhead expense allocation is very commonly used as a short cut to, or near approximation of, the time factor, and also because of the simplicity and convenience of the method. However, it is unsuitable where different types of labour, receiving different hourly rates of pay, are employed in the same cost-centre.

(63) The 'man-hour' rate is considered to be a more advanced method for the purpose of applying overhead expense to product costs mainly on the ground that it represents a closer approach to the process-time factor. It is unsuitable, however, wherever a man is employed to tend more than one machine, so that the total of man-hours is less than the total of process-hours.

(64) The 'machine-hour' rate is a more elaborate method of applying overhead expense to product costs and is most suitable for those processes necessitating the use of expensive or elaborate machinery. The calculation of machine-hour rates requires considerable skill, and collaboration is necessary between the cost department and the various executives responsible for fixing operating standards for machines. Machine-hour rates may be estimated either inclusive or exclusive of operators' wages; and in some cases include only the overhead expense directly identifiable with the particular machine, supplementary man-hour rates being then used to take care of other factory overhead expense.

(65) The fourth method of absorbing overhead expense—namely, by unit of product—is applicable to certain industries manufacturing one main product through a series of processes. Although overhead expense can be absorbed in this manner in order to ascertain

unit costs, the factors of process efficiency and plant utilisation should always be taken into consideration, as overhead costs per unit will always vary in relation to volume of output.

(66) It should perhaps be added that it is not unknown for overhead expense to be applied as a percentage on the total of direct labour and material expense. This method is illogical inasmuch as overhead expense is normally related to the effluxion of time and not to the value of the material used. For example, if two articles are manufactured under exactly similar conditions of design, labour and machinery, except that in one case the material used is an expensive alloy and in the other a relatively cheap metal, the charge for factory overhead expense which is made under this method to the product fashioned from the more expensive material would be considerably greater than to the other product. This obviously cannot reflect the facts of the situation; the difference in the cost of the two products should be confined to the variation in cost of the raw material used, all other factors being alike.

Conclusions

(67) In contrasting the above methods of allocating overhead expense it will be appreciated how vital it is that the allocation should be based on sound methods and that the choice of method to be used should in all cases be governed by the nature of the case and the purpose for which the particular costs are required. Arbitrary treatment of overhead expense for costing purposes will inevitably produce erroneous results likely to be worse than useless to management; faulty costing can lead to mistaken decisions of policy and result ultimately in financial loss which might have been avoided if the costing methods used had been appropriate to the circumstances.

(68) It has previously been stated that one of the main purposes of cost accounting is to provide management with an instrument of control over all forms of operating expense. For this purpose the accounting technique which is known as standard costing (discussed in Section VII) is likely to prove the most serviceable of all, especially in regard to overhead expense.

VI. DISTINCTION BETWEEN FIXED AND VARIABLE EXPENSE

(69) An important preliminary consideration in deciding upon bases of allocation of overhead expense is the fact that some expenses vary directly in relation to changes in the volume of output while others, being incurred in relation to time, remain more or less fixed in amount. In fact, all expense may be divided into three distinct groups, namely:

(*a*) *Fixed*, i.e. expense which does not vary with output and which remains more or less constant irrespective of moderate changes in the level of activity attained, e.g. management salaries, rent, rates, building maintenance.

(*b*) *Variable*, i.e. expense which may be expected to vary directly in proportion to output or turnover, e.g. consumable stores, salesmen's commission.

(*c*) *Semi-variable*, i.e. expense which is neither wholly fixed nor wholly variable, but which contains elements of both the previous types of expense, e.g. electricity for power where there is a basic charge, after which the expense varies with consumption or output.

In practice it is often possible to dispense with the semi-variable group, all expense being included in either the fixed or the variable group.

(70) Unless a cost accounting system pays due regard to the difference between these three types of expense, the costs produced for individual products will obviously vary according to the volume of production achieved. We have attempted (Figure 4) to demonstrate the influence of fixed, variable, and semi-variable overhead expense on product costs per unit at varying levels of output.

(71) There are many occasions when all-inclusive costs (i.e. costs inclusive of fixed overhead expense) are inadequate in enabling management to solve readily many of the problems confronting it from day to day. For example, when deciding:

(*a*) whether to buy a part from outside, or to make it in the factory;

(*b*) whether or not to install new plant;

(*c*) whether or not to take an extra order at less than normal market prices.

(72) In considering (*a*) above, it will probably be unnecessary to include any sum for works management salaries and supervision in estimating the cost of making the part in the factory; in

Figure 4

STATEMENT ILLUSTRATING THE EFFECT OF VOLUME ON OVERHEAD COST PER UNIT

Volume of trade in units	20,000	40,000	60,000	80,000	100,000	120,000
Overhead expense	£	£	£	£	£	£
Fixed	9,000	9,000	9,000	9,000	9,000	15,000
Semi-variable	7,000	7,250	9,500	9,750	10,000	12,250
Variable	2,000	4,000	6,000	8,000	10,000	12,000
Total	£18,000	£20,250	£24,500	£26,750	£29,000	£39,250
Overhead cost per unit	*pence*	*pence*	*pence*	*pence*	*pence*	*pence*
Fixed expense ..	108	54	36	27	21.6	30
Semi-variable expense ..	84	43.5	38	29.25	24	24.5
Variable expense ..	24	24	24	24	24	24
Total	216	121.5	98	80.25	69.6	78.5

considering (*c*) above, assuming that the works are operating at less than full capacity, there may be no need to add the full amount of fixed overhead expense in deciding whether a further order will be advantageous or not.

Costs compiled only on an all-inclusive basis not only become frequently discredited but also bring costing itself into discredit, as they come into conflict with empirical knowledge that marginal prices, although insufficient to cover a full allocation of overhead expense, may still be remunerative. (73)

What is needed is a method of building up product costs which distinguishes at every stage between expense which remains virtually unchanged at whatever level (within reason) production is carried on—that is to say, the fixed expense of a business—and expense which increases or decreases directly under the influence of a changing volume of production, i.e. the variable expense of a business. It would be dangerous to eliminate fixed expense from production costs altogether; the solution is to include all overhead expense but to make a clear division between variable and fixed expense in the costing rates. (74)

There would then be two overhead expense rates for each cost-centre; one covering items which vary in relation to output, which would remain relatively constant as a rate in relation to the volume of work going through the cost-centre; the other rate relating to fixed expense, which would alter as a rate in relation to changes in the volume of work. The appropriate rates can then be applied according to the particular purpose for which it becomes necessary to compile a cost. (75)

VII. STANDARD COSTING

Requirements of management

(76) When costing first developed, the efforts of cost accountants were directed to ascertaining the actual amount of expense incurred in the making of a given product or the rendering of a particular service. The costs so arrived at were merely a record of past performance and therefore historical in their nature. Such costs reflected the facts of the situation accurately enough, but suffered from the drawback of having been prepared after the event and were thus unable to supply vital control information essential to management.

(77) Without some reliable measure with which to compare operating costs, management is working in the dark. This fact is not often realised and is undoubtedly a source of weakness in existing costing methods employed in this country. For instance, it is difficult, without a standard of measurement, for a manufacturer to satisfy himself on the following important points:

(*a*) that the best use has been made of raw materials and that the proportion of scrap is reasonable;

(*b*) that the right type of direct labour has been used, that the production time taken is reasonable, and that the quality of the production is satisfactory;

(*c*) that the flow of production through the various processes has been satisfactory and that no unnecessary interruptions have occurred;

(*d*) that the right type of plant and equipment have been used;

(*e*) that the shops have not been extravagant in the use of consumable supplies;

(*f*) that idle or standing time of production facilities and labour have been kept to a minimum.

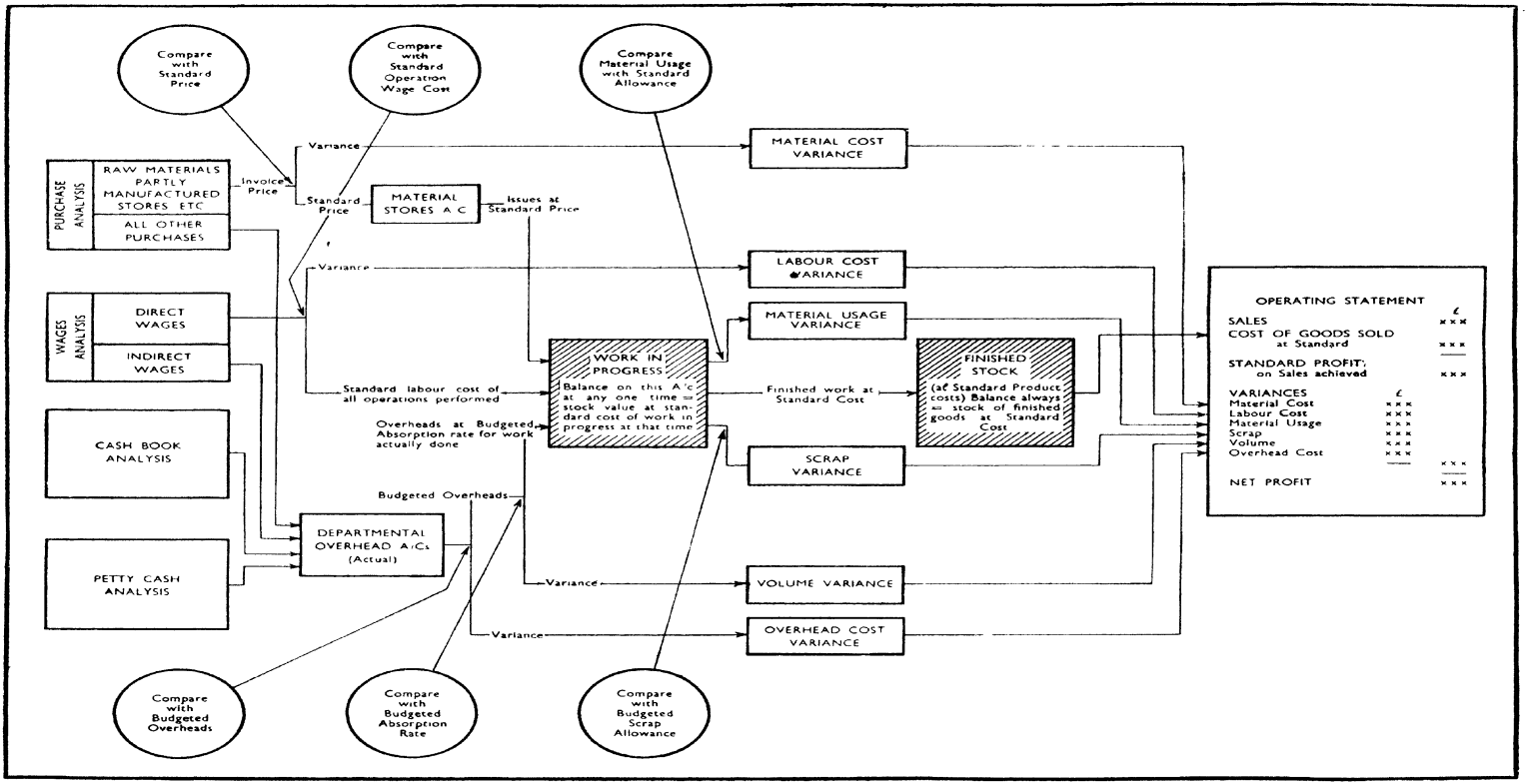
(78) Costs which do not provide a standard of measurement cannot provide a complete view of the facts to be taken into account in judging efficiency of production. The actual cost of a product, regarded in isolation, gives no indication as to whether that cost is or is not an economic cost. It is true that historical costs are often compared with the costs of similar products previously manufactured; but there is here a hidden and serious risk of comparing one uneconomic cost with another, both of which may reflect varying degrees of inefficiency. Examination of a continuing series of historical costs will not disclose any information on the points listed in the preceding paragraph, if the same faults have been present throughout. The function of costing

Figure 5
(*see over*)

Figure 5

An example of standard costing as applied in practice

DIAGRAM ILLUSTRATING THE FLOW OF ACCOUNTING INFORMATION



as an instrument of control may thus be defeated and the costs produced, however accurate, may be relatively valueless from the control point of view.

(79) It would not be true to suggest that standards of comparison have not been used in the past. It has always been common practice to prepare cost estimates as a basis for tendering and during the war technical cost estimates were often prepared as a basis for fixing contract prices by Government departments. But in such cases the comparison between the estimates and the actual historical costs does no more than test the accuracy of the estimating; it does not enable management to exercise control over production.

Essence of standard costing

(80) It was only when the accounting technique known as standard costing came to be developed that management found it had at hand a systematic method of comparing everything that occurred in the whole manufacturing process with estimated or predetermined standards of cost and performance.

(81) Whereas historical costing takes place after the event, an essential step in standard costing is to set up in advance of events a carefully prepared estimate of what an efficiently produced article or process ought to cost under normal conditions for the factory concerned. Such predetermined or standard costs are prepared in much the same way as technical cost estimates and in exactly the same detail as historical costs, but—and this is the important point—are integrated with the whole accounting system in such a way that management is able to see how far, and in what direction, each item of actual expense diverges from the standard so set up in advance. An illustration of how this integration is effected is given in Figure 5.

(82) These divergences from the predetermined standards—or 'variances', as they are called—are facts of the utmost value to management, because if they are promptly reported the causes can be ascertained and corrective action can be taken immediately. In this way, faults and inefficiencies can be located and corrected before the loss they cause has time to become serious. The time factor is of vital importance; apart altogether from the absence of a standard of measurement, historical costs cannot usually be prepared in time to serve as an instrument for managerial control.

(83) The control which can be exercised through standard costing is on the principle of 'management by exception'—that is, of dealing with exceptions to or variances from standard or normal.

It is a method which serves to focus attention only on those matters requiring management action, while relegating to the background all those matters which are proceeding according to plan. It thereby saves managers the time and the effort of sifting masses of costing information to ascertain which matters need attention and at the same time ensures that no faults are overlooked.

(84) Standard costing sets up targets which can be reached by reasonably efficient working; and the distance by which the target is missed is the measure of the remedial effort needed. Some people take the view that standards should be fixed by reference to technical ideals, but in that case no improvement over the target would be possible. For practical and psychological reasons, therefore, it is generally considered desirable to fix standards by reference to a good, but not ideal, performance; under this method, it is possible for management to produce better results than standard, which may act as a stimulus to even greater achievements.

(85) It will be appreciated that the standards adopted must be revised from time to time in the light of changed conditions. Out-of-date standards may result in complacency or tend to discourage effort where vigorous action is in fact required. On the other hand, a complete revision of standards usually involves a considerable amount of work. It may be possible, by the adoption of 'revision variances' (paragraph (101)), to avoid a detailed revision whilst still keeping the standards up-to-date for the purposes of cost control and cost ascertainment.

Outline of a standard costing system

(86) It is not possible within the limits of this memorandum to do more than touch upon the general principles involved in standard costing. Much pioneering work has already been done but unfortunately few suitable text-books have been produced in this country. There are, however, a number of excellent standard works which have been written and published in the United States. This gap in British accounting literature is one which, in our view, should be filled at an early date. Because this gap exists, however, we have deemed it worth while to devote paragraphs (87) to (105) to an examination of the principles relating to one of the most advanced systems of standard costing so far developed on a considerable scale in this country.

(87) In considering the structure of this particular system, it should constantly be borne in mind that the main purpose behind it is the control of cost and not merely the ascertainment of cost; and that it is this main purpose which determines the method

selected when there is a choice between alternatives. We have already stated that an accounting system for ascertainment of cost is of little practical value to management unless the process of cost ascertainment is linked with the control of cost which is equally important. The system here outlined presents a logical working out of this view; control of cost is secured through the comparison of standard or normal with actual—not only for expense but also for output and performance.

(88) Fundamentally, cost is the result of combining two factors—EXPENSE and OUTPUT. For example, if expense remains constant and output increases, cost falls; if expense increases and output remains at the same level, cost rises. To obtain control of cost, it is therefore necessary to establish standards or normals for both of these factors against which actual expense and output may be measured for all manufacturing processes.

Budgeting for expense

(89) In regard to the EXPENSE factor, control is exercised through what is called 'flexible budgeting'. We have already described in Section V the methods which should govern the allocation of overhead expense to cost-centres; budgets are established for all overhead expense and labour costs in the same degree of detail as that adopted for expense allocation in the accounts. This permits the detailed comparison of actual with budgeted expense as and when incurred and facilitates the reporting of variances to management.

(90) As already stated, it is necessary for expense to be related to output in order to obtain cost. It is fundamental to any proper system of cost control that normal output must absorb, or bear the cost of, normal expense. Therefore, budgets are set for all items of expense at a normal level of output for each manufacturing process. We have pointed out, however, in Section VI, that items of expense can be classified as fixed, variable, or semi-variable. Consequently, it is also necessary in the case of semi-variable and variable expense to set budgets at varying levels of output above and below normal in order that the correct allowances may be made for changing levels of activity. For instance, a departmental manager must be permitted to incur additional variable expense for power, supervision and consumable stores, in the event of his processes being worked overtime or double shift. In this way, the expense budgets are made flexible, and become suitable instruments for cost control under varying output conditions.

Budgeting for output

(91) In regard to the OUTPUT factor, it is necessary to adopt a scale of measurement. The difficulty in this is to find a unit that can be applied equally satisfactorily to the whole range of products that may be made in a single factory. Consequently, it is necessary to adopt a unit of measurement independent of the product itself; and the unit which is used in the system here outlined is the STANDARD HOUR. A standard hour is the amount of work or output of any given product or process which it is estimated should be produced in one clock hour. For example, if it is estimated by a competent person that it is reasonable to expect 30 articles to be produced or processed by an operator in an hour, then an output of 300 articles would represent 10 standard hours, irrespective of the actual time taken to produce them.

(92) By this means, all work done in any stage of manufacture can be reduced to the common denominator of TIME, in a manner similar to that in which goods bought or services rendered can be expressed by the common denominator of money. The use of time as the common denominator has great advantages, permitting the adoption of the standard costing technique by a wide variety of industries and by works making a wide range of products. In fact, it is the very diversity of production that has led to the use of time as the most suitable unit of measurement.

(93) Standard hours may be used also as a measure of PERFORMANCE. Thus, if the said 300 articles, equivalent to 10 standard hours, are produced in an *actual* time of 8 hours, performance or efficiency is rated at 125 per cent. (i.e. 10 as a percentage of 8), or 25 per cent. better than standard. Similarly, if 12 *actual* hours are taken to produce the articles, performance is rated at 83.3 per cent. (i.e. 10 as a percentage of 12).

(94) Having selected the unit of measurement, it is necessary to establish a normal level of output in terms of standard hours for each cost-centre in the undertaking. This normal level, when related to the budgeted normal expense, gives costing rates per standard hour for each cost-centre. In turn, these costing rates, when related to the standard time required by each operation on each product, provide a means for ascertaining the cost of the product.

(95) When establishing the normal standard hours which can reasonably be expected from any productive process, due regard is paid to the exigencies of manufacturing conditions. The normal, therefore, is generally less than theoretical capacity and is a level attainable by the factory when operating with reasonable competence and efficiency.

(96) It will be appreciated that output is affected by performance. If, for example, a normal of 500 standard hours is set and 550 standard hours are produced, then the output or activity is rated at 110 per cent. of standard (i.e. 550 as a percentage of 500). Such an improvement in activity might be achieved either by the use of capacity greater than normal, e.g. double shift working, or by the attainment of an efficiency greater than 100 per cent. coupled with a normal usage of capacity, or by a combination of both. The prompt reporting by the cost department of both these factors of output (or ACTIVITY) and performance (or EFFICIENCY) for each cost-centre, in relation to standard or normal output and performance, is vital to management.

Operating statements

(97) We attach a series of operating statements (Appendix) used in connection with this system of standard costing, which illustrate, amongst other things, the method of reporting activity and efficiency factors. The statements do not purport to be comprehensive, but are a representative selection of documents prepared by the cost department in reporting to management. It is hoped that they are in general self-explanatory, but the following comments on technical terms may be helpful.

(98) The difference between standard cost (equivalent to budgeted normal cost) and actual cost is obviously the total variance. While, however, the total variance is of considerable importance to the general manager, it is only necessary to report to the departmental manager on the variance between his actual cost and the cost he is allowed for the work he has done. Consequently, the standard or budgeted normal cost has to be modified in order to give a correct allowance of expense in relation to the actual output achieved. This modified budget then becomes the ALLOWED COST for the departmental manager; and the difference between that allowed cost and the actual cost is the CONTROLLABLE VARIANCE—i.e. controllable by the departmental manager. It is obvious, we think, that the departmental manager of a shop in the factory cannot be held responsible for cost variances due to changes in the volume of work required from his shop or for changes in the cost of materials (to take but two examples), but that cost variances due to labour efficiency and material usage are within his power to control.

(99) Since costs are set so that normal expense is absorbed by normal output, VOLUME VARIANCE represents the over- or under-recovery of expense due to changes in the volume of output. It is of particular importance to segregate this variance. If that is not done (in other words if the principle of charging normal expense to normal output is not adopted), a temporary fall in

output causes an increase in cost which, if reflected in increased prices, will probably cause a further fall in volume. (The converse, of course, will also apply.) It should be understood, however, that if circumstances change and what were considered originally as temporary circumstances become established as normal, the volume variance may, after consideration and as an act of policy, be absorbed in cost by resetting the budgets of output.

(100) CALENDAR VARIANCE is a self-adjusting variance by which allowance is made for the automatic under- or over-recovery of fixed expense due to the varying number of working hours or days in any given period.

(101) REVISION VARIANCES are the amount of agreed alterations to budgets (including alterations in material and labour costs) which alterations, as a matter of policy, have not been given effect to in the costing rates. The effect of a national wage award, for example, might be dealt with in this way if it is decided, for the time being, not to revise the standards in detail.

(102) Control of purchase price is obtained by fixing in advance standard material prices and by using these prices for valuation of materials. The difference between the value at these standard prices and the value at the prices at which materials purchased are actually invoiced is the MATERIAL PRICE VARIANCE. Such variances may indicate a need for a change in buying policy; for alteration of the kind of material used; or for the amendment of the standard material prices themselves, if circumstances warrant it, with a consequent amendment of the relevant standard product costs.

(103) MATERIAL USAGE VARIANCE is a controllable variance and represents the loss or gain due to using in any process more or less material than that laid down in the standard cost specifications.

(104) Other controllable variances are:

(*a*) EXTRA ALLOWANCES, being the cost of additional time allowed to labour over and above standard times for particular operations—due, for instance, to unusual hardness of material to be worked, or to excess metal to be taken off.

(*b*) EFFICIENCY VARIANCES, representing losses or gains due to work being performed in longer or shorter time than the standard time allowed plus extra allowances.

(*c*) LABOUR COST VARIANCES, representing increases or decreases in labour cost due to the use for particular jobs of more or less expensive labour than that provided for in the budget; and also increases or decreases in wages earned as a result of more or less speedy production.

(*d*) EXPENDITURE COST VARIANCES, to cover increases or decreases in the actual cost of overhead expense compared with budgeted overhead expense adjusted to meet the conditions of any given period.

Finally, the profit and loss statement is drawn up in such a way as to throw into relief, by means of the variances indicated, the difference between the profit which might have been earned had all standards been achieved and the profit or loss which has actually been attained. In other words, the profit and loss statement shows not only what has happened but also why it has happened. (105)

Advantages of standard costing

The advantages which experience shows can be obtained from the application of standard costing, especially if based on the foregoing principles, are as follows: (106)

(*a*) it ensures the control of all factors, whether related to expense or output, which affect production cost;

(*b*) it provides management with regular and prompt reports of all matters which are not proceeding according to plan or expectations, thus enabling corrective action to be taken immediately to deal with losses and inefficiencies; and at the same time saves management the necessity of spending time and effort in sifting masses of detail to discover what those losses and inefficiencies are and where they arise;

(*c*) it segregates the effect on costs of temporary rises or falls in the volume of output and sales;

(*d*) it is normally more economical in clerical labour than any other method of providing management with the same kind of information, for both small and large businesses;

(*e*) it is not ordinarily necessary to prepare separate terminal or job costs; if these are required they can easily be obtained by adjusting the individual standard costs by the ascertained variances;

(*f*) it proves the accuracy of product costs at every stage of the manufacturing process; and provides complete integration of cost and financial accounts without the need for any kind of reconciliation between separate sets of records.

Because of these advantages over other methods of cost accounting, standard costing has found considerable favour in management circles in this country and to an even greater extent in the United States of America. It has already been employed in this country in a wide variety of different industries, ranging from the manufacture of cosmetics to locomotives. The system may be elaborate or simple according to the size and type of business, provided it is based on the essential principles of standard costing. (107)

(108) It is far too commonly supposed that this method of cost accounting is only applicable to industries producing standardised products. That, however, is not the case. The term standard does not refer to the product, but to the predetermined levels of output and expense used to measure subsequent events.

(109) It may be argued that the present is a particularly unsuitable time for introducing such a system of accounting control, in view of the difficulty of foreseeing the effects of such disturbing factors as fuel shortages, strikes and control of raw materials; and hence of predetermining any standards for future cost. But no manufacture is ever started without some assumptions being made about the future. Makers of raincoats, for instance, may be no better than the rest of us at forecasting the vagaries of an English summer, but they plan their production, consciously or unconsciously, on the basis of certain assumptions about it. All that is required for any system of standard costing is that these assumptions should be set down in writing and figures and then used as the standards against which subsequent performance and expense can be measured. If there are special factors operating, such as those mentioned earlier in this paragraph, it is important that management should know the variances due to those causes.

(110) In our view standard costing is a most important development in accounting technique, which enables the accountant to provide management with vital information essential for the day-to-day control of a manufacturing organisation. As such, it merits the closest study not only by accountants engaged in industry but also by practising accountants who are or may be required to advise their clients on the subject of cost accounting.

VIII. UNIFORM COST ACCOUNTING

Trend towards uniformity

(111) In the years before the war, there was a marked trend towards the establishment of uniformity in cost accounting methods within certain industries—the Master Printers being an early example and the Bolt and Nut Manufacturers one of the more recent. Individual businesses in the same industry, while still remaining competitors, had been entering into increasingly closer collaboration through their trade associations; and had recognised the advantages of avoiding under-cutting through faulty costing, by ensuring that costs were compiled on a uniform basis so as to put all manufacturers on the same footing.

(112) The Industrial Organisation Bill lists as one of the functions of the proposed development councils, the duty of promoting the uniformity of accounting and costing practice within an industry. It therefore seems certain that an increasing number of the more important industries will set up machinery for this purpose. The accountancy profession cannot afford to ignore this trend, set in motion by individual industries on their own initiative. It is evident, in fact, that the profession will be called upon to give advice in the formulation of uniform cost accounting schemes. In that lies both a challenge and an opportunity for the profession to lead and guide future developments.

Extent of uniformity required

(113) It has been found in practice that uniform cost information cannot be satisfactorily obtained for a whole industry unless uniformity has first been secured in the basic principles on which the cost accounting of member firms is founded. In short, uniform costing requires uniform accounting; and the accounting technique of standard costing is a particularly appropriate basis for uniform schemes.

(114) Uniformity within industries should extend to:

(*a*) accounting and costing terminology, including the technical terminology applicable to the industry concerned;

(*b*) classification of all incomings and outgoings, both of a capital and a revenue nature;

(*c*) classification of the elements of cost, so as to ensure that particular items of expense are treated in the same way by all member firms;

(*d*) allocation of overhead expense to cost-centres and products;

(*e*) division of overhead expense into fixed, variable, and semi-variable items;

(*f*) rules of asset valuation and bases of depreciation.

(115) The scheme should provide the best accounting and costing methods known to the industry and its advisers. For the advanced firm this means that its well-developed systems are improved by the joint consideration of problems and difficulties as they occur; and for the backward firm it means that an opportunity is given for the introduction of a system equal to the best in the industry. Further, provision should always be made for revision and amendment when necessary, so as to avoid undue rigidity.

(116) As pointed out earlier in this memorandum, the use of costing is very largely a matter of comparison. The value of cost information lies in the ease and rapidity with which it can be used for the purposes of comparing standard performance under normal manufacturing conditions with actual performance. Owing to the infinite variety of design of products manufactured within the same industry, ascertained product costs are often of little value for comparison purposes. It seems to us, therefore, that no uniform system of cost accounting for a particular industry will be of much value unless it provides for the measurement of manufacturing costs by actual and standard hours per process. This is borne out by the report of the Costing Committee for the Cotton Industry, which devoted considerable attention to a comparison of production costs for Lancashire looms and automatic looms.

(117) We do not under-estimate the difficulties involved in formulating uniform schemes of cost accounting. Experience proves, however, that uniform accounting and costing schemes are being applied successfully, and as a matter of course, to groups of factories under the control of one central organisation and to the different subsidiary companies of a parent company.

(118) To secure uniformity for a considerable number of separately owned factories presents problems not encountered in a single organisation or group, on account of the different organisation structures and methods of manufacture which are often encountered in the same industry. The difficulties are, however, by no means insurmountable, because the processes are essentially similar and comparable.

IX. CONCLUSIONS

For convenience we set out a summary of our main conclusions.

Cost control

A sound costing system must place the same emphasis on cost control as on cost ascertainment. (Section I.) (119)

Use of costs

Costs are used for many different purposes and the content of any cost should always be determined by the use to be made of that cost. (Section II.) (120)

Organisation

The cost and financial accounting records should be integrated and complementary, two parts of one whole; and the chief accounting executive of any organisation should be responsible for seeing that all sections of the accounting organisation contribute to the common end. (Section III.) (121)

Overhead expense

The bases of allocation of overhead expense in all costing systems merit the most careful consideration, as an arbitrary allocation will provide management with misleading figures. In applying overhead expense to product costs, time is usually the dominating factor to be taken into account although in some instances space or weight are additional factors. (Section V.) (122)

Fixed and variable expense

The costing system should be so designed as to distinguish between the fixed, variable and semi-variable expense of the business at every stage of cost analysis and absorption. (Section VI.) (123)

Standard costing

Historical costing—in which the figures are prepared after the event—fails to present vital control information essential to management. Developments in cost accounting have therefore placed the greatest possible emphasis on standard costing, which involves the comparison of actual expense when and where incurred with predetermined standards. In our opinion the most advanced method of cost control—and also the most economical in operation—is that of standard costing linked with flexible budgeting of costs incurred in the operation of each individual process. (Section VII.) (124)

Uniform cost accounting

The accountancy profession has an opportunity to lead the future development of the trend towards uniformity of cost accounting within industries. (Section VIII.) (125)

The future

(126) Management is increasingly appreciating the importance of sound cost accounting information as a basis for production planning and cost control. In our view the accountancy profession will be expected in the future to play a prominent part in the improvement and development of the cost accounting methods employed by industrial undertakings. It is not enough for the profession merely to prepare what is asked for by managements in their search for guidance; it is for the profession to show managements the information which can be made available and the ways in which it can be fully utilised.

June, 1947 *Moorgate Place, E.C.2.*

APPENDIX

Standard Costing
SPECIMEN OPERATING STATEMENTS

The following series of operating statements are specimens taken from practice. They are derived from a system based on the use of flexible budgets and the standard costing method outlined in principle in Section VII. They should not be regarded as models suitable for universal application, but the underlying principles governing this technique of cost control are applicable to most types of manufacturing organisations and, with suitable modifications, to other types of commercial activity. The specimens appended are as follows:

1. Main profit and loss statement.
2. Departmental profit and loss statement.
3. Standard profit and loss by products.
4. Summary operating statement.
5. Departmental operating statement.
6. General works operating statement.

Explanatory notes are included against each statement.

STATEMENT No. 1

EXPLANATORY NOTES

This statement contains in summarised form the information normally included in a traditional profit and loss account—but all the expenditure involved in producing the goods sold for a value of £6,980 in the period in question is broken down into its elements of cost and is first shown at predetermined standards, having regard to the normal level of output and efficiency for the factory.

From these standard cost figures are deducted the variances which are shown in detail on the supporting operating statements. It will be observed that the variances in the aggregate amount to £1,414 and represent a loss of profit which would have been earned had the factory operated at normal levels of activity and efficiency for the period in question.

This profit and loss statement, therefore, serves not only the purpose of informing management as to (1) the total sales effected, (2) the expected cost of manufacturing an attainable quantity of products for sale during the period in question, and (3) the profit earned on the sales effected—but also (4) the costs of variations from normal standards of production efficiency and the losses arising owing to the volume of sales being less than those expected.

Opening and closing stocks, which are commonly shown separately in the traditional form of profit and loss account, have been taken into account in arriving at the standard cost of sales.

MAIN PROFIT AND LOSS STATEMENT

PERIOD No. 7
ENDING 20th December, 1946

	THIS PERIOD		SEVEN PERIODS TO DATE	
	Standard and variances	Actual	Standard and variances	Actual
	£	£	£	£
Sales				
Standard	14,000		98,000	
Quantity variance	7,020		57,460	
		6,980		40,540
Material Cost				
Standard	2,926		18,664	
Variances:				
Price	223		928	
Usage	148		528	
		3,297		20,120
Labour Cost				
Standard	963		6,145	
Variances:				
Efficiency	300		3,261	
Rates of pay	138		1,197	
		1,125		8,209
Direct Expense				
Standard	315		2,010	
Variances:				
Efficiency	52		457	
Expenditure	90		1,462	
Volume	63		421	
Calendar	8		9	
Prime Cost		512		4,359
General Works Expense				
Standard	631		4,023	
Variances:				
Efficiency	87		764	
Expenditure	26		421	
Volume	470		3,145	
Calendar	43		44	
Factory Cost		1,119		7,555
Head Office Expense				
Standard	91		581	
Volume variance	196		1,312	
		287		1,893
Total Cost				
Standard cost of SALES	4,926		31,423	
Total variances	1,414		10,713	
		6,340		42,136
Profit	2,054	640	9,117	1,596

Statement No. 1

STATEMENT No. 2

EXPLANATORY NOTE

This statement is a rearrangement of statement No. 1, so as to show the standard profit analysed to each of the main departments of the business. The variances are summarised so as to show clearly the gain or loss resulting from each main cause.

DEPARTMENTAL PROFIT AND LOSS STATEMENT

PERIOD No. 7
ENDING 20th December, 1946

	TOTAL		DEPT. A/B		DEPT. C		DEPT. D	
	This period	Seven periods to date	This period	Seven periods to date	This period	Seven periods to date	This period	Seven periods to date
	£	£	£	£	£	£	£	£
Sales	6,980	40,540	2,417	19,590	2,409	12,488	2,154	8,462
Standard cost of sales	4,926	31,423	1,436	13,959	1,900	10,445	1,590	7,019
Standard profit ..	2,054	9,117	981	5,631	509	2,043	564	1,443
Variances:								
Volume	729	4,878						
Calendar	51	53						
Material price	223	928						
Works Controllable	513	4,854						
Total variances	1,414	10,713						
Actual profit/loss	640	1,596						

Statement No. 2

STATEMENT No. 3

EXPLANATORY NOTE

In this statement the sales for department A/B are analysed by products, showing for each the amount and rate of standard profit or loss. The purpose of this information is to concentrate sales effort on the most profitable products. A similar analysis would be available for each department.

STANDARD PROFIT AND LOSS BY PRODUCTS

DEPARTMENT A/B

PERIOD No. 7
ENDING 20th December, 1946

Product	Quantity sold (Gross)	Budgeted sales	Actual sales	Standard cost	Standard profit	Profit as percentage of sales
		£	£	£	£	%
1	2,850	500	228	66	162	71
2	240	100	76	29	47	62
3	2,233	400	288	191	97	34
4	224	300	149	189	40	27
5	470	1,000	499	312	187	37
6	40	200	42	27	15	36
7	276	300	172	192	20	12
8	229	300	312	154	158	51
9	252	800	413	193	220	53
10	1	50	10	7	3	30
11	26	400	135	43	92	68
12	648	400	93	33	60	64
	7,489	4,750	2,417	1,436	981	41

STATEMENT No. 4

EXPLANATORY NOTES

On this statement are summarised the manufacturing costs for the period in question for all departments. These costs are compared with the standard costs for the normal level of output in the various manufacturing departments. The statement also includes a comparison of standard and actual costs for general works expense and for materials consumed in manufacture.

It should be noted that the standard and actual cost figures given in this statement refer to cost of output, whereas the figures given in statement No. 1 refer to cost of sales.

Actual cost of output for period seven amounted in total to £6,542 compared with the standard cost of £5,128.

The primary analysis of variances is to those caused by:

Volume of output (paragraph (99)).

2. Calendar (paragraph (100)).
3. Revisions of standards of expense (paragraph (101)).
4. Prices paid for materials (paragraph (102)).
5. Controllable expense (paragraphs (103) and (104)).

The secondary analysis gives details of item 5, controllable expense, analysed departmentally and so as to show whether due to:

6. Efficiency of operation.
7. Amount of expenditure.
8. Usage of material.

It is evident that:

(*a*) No department has reached the expected level of performance, the most costly deficiency being in department A.

(*b*) The under-absorption of overhead expense (volume variance) due to the low level of output (46 per cent.) is very heavy (£729).

(*c*) Materials have been purchased at prices in excess of those budgeted to the extent of £223.

(*d*) Materials have been used in excess of standard quantities to the extent of £148.

The total figures for the period are transferred to the appropriate line in the cumulative section of the statement to produce cumulative figures for the year to date.

SUMMARY OPERATING STATEMENT

	This Period	To Date
ACTIVITY ..	46	43
EFFICIENCY ..	77	67

PERIOD No. 7
ENDING 20th December, 1946

DEPARTMENT	No.	Activity	Efficiency	Standard cost of output	Actual cost of output	Total variance	VARIANCE ANALYSIS										
							Volume	Calendar	Revision	Material price	Works controllable	Works controllable variance analysis					
												Direct labour			Expense		Material usage
												Extra allowances	Efficiency	Rates of pay	Efficiency	Expenditure	
		%	%	£	£	£	£	£	£	£	£	£	£	£	£	£	£
A	1	23	64	358	553	195	18	2	—	—	[illegible]	—	164	70	21	64	—
B	2	54	57	81	158	77	—	—	—	—	77	—	40	9	20	8	—
C	3	51	91	551	605	54	41	5	—	—	18	—	18	16	1	18	—
D	4	90	85	396	429	33	4	1	—	—	30	—	48	61	7	36	—
TOTAL PRODUCTION ..		46	77	1,386	1,745	359	93	8	—	—	304	—	300	138	52	90	—
General works				590	1,078	488	370	43	—	—	61	—	—	—	87	26	—
Materials				2,980	3,351	371	—	—	—	223	148	—	—	—	—	—	148
Head office expenses ..				172	368	196	196	—	—	—	-	—	—	—	—	—	—
TOTAL FOR THE PERIOD		46	77	5,128	6,542	1,414	729	51	—	223	513	—	300	138	139	64	148

SUMMARY FOR THE YEAR	No.	Activity	Efficiency	Standard cost of output	Actual cost of output	Total variance	VARIANCE ANALYSIS										
							Volume	Calendar	Revision	Material price	Works controllable	Works controllable variance analysis					
												Direct labour			Expense		Mater usag
												Extra allowances	Efficiency	Rates of pay	Efficiency	Expenditure	
		%	%	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Period No.:	1	45	61	5,726	7,852	2,126	688	40	—	222	1,176	—	923	205	78	843	229
,,	2	39	61	2,490	4,012	1,522	700	77	—	196	549	—	388	103	161	44	97
,,	3	42	59	4,016	5,562	1,546	637	70	—	51	788	—	638	151	283	118	146
,,	4	41	63	5,115	6,767	1,652	634	76	—	2	950	—	595	259	249	378	
,,	5	40	68	4,119	5,615	1,496	782	36	—	220	530	—	437	201	190	121	1
,,	6	46	78	4,623	5,580	957	708	37	—	18	268	—	298	140	113	19	2
,,	7	46	77	5,128	6,542	1,414	729	51	—	223	513	—	300	138	139	64	14
TOTAL TO DATE ..		43	67	31,217	41,930	10,713	4,878	53	—	928	4,854	—	3,761	1,197	1,221	1,041	52

STATEMENT No. 5

EXPLANATORY NOTES

This statement sets out all the necessary control information for department A; similar statements would be prepared for departments B, C and D. The statement discloses costs and variances for each cost-centre within the department, and gives details of all expense incurred directly for or by the department.

The low level of output (23 per cent. of normal) is caused by lack of labour, materials and orders; and to some extent by inefficiency or low rate of output of the operators (64 per cent. of normal). Pressing is the cost-centre which shows the greatest loss (£44), although its efficiency percentage is not so low as some of the other sections; the cost of the low output by the operators (£89) is offset to some extent (£45) by the lower bonus earnings consequent upon the lower rate of output.

In the expense section it will be seen that warehousing and maintenance expense has been considerably in excess of the costs allowed for the levels of output attained.

DEPARTMENTAL OPERATING STATEMENT

DEPARTMENT A

	This Period	To Date
ACTIVITY ..	23	21
EFFICIENCY ..	64	50

PERIOD No. 7
ENDING 20th December, 1946

COST CENTRE	No.	Activity %	Efficiency %	Allowed cost	Actual cost	Controllable variance	Variance analysis: Extra allowances	Variance analysis: Efficiency	Variance analysis: Rates of pay	Accumulation for 7 periods: Allowances	Accumulation for 7 periods: Variances
		%	%	£	£	£	£	£	£	£	£
Cutting	1	24	63	46	57	11	—	27	16	481	263
Forming	2	16	41	11	21	10	—	15	5	134	116
Flanging	3	12	44	5	11	6	—	6	—	64	84
Spinning	4	20	64	30	44	14	—	17	3	542	246
Pressing	5	35	69	151	195	44	—	89	45	1,363	814
Trimming	6	12	110	14	17	3	—	9	12	296	105
Screwing	7	38	71	18	17	1	—	8	9	135	59
Capping	8	24	68	25	32	7	—	11	4	322	88
TOTAL DIRECT LABOUR	—	23	64	300	394	94	—	164	70	3,337	1,775

EXPENSE	Account No.	Control basis *	Normal budget	Allowed cost	Actual cost	Controllable variance	Variance analysis: Efficiency	Variance analysis: Expenditure	Accumulation for 7 Periods: Allowances	Accumulation for 7 Periods: Variances
			£	£	£	£	£	£	£	£
Service labour	404	S	18	12	14	2	3	1	120	173
Cleaning	405	V	9	2	2	—	1	1	100	4
Warehousing	406	S	51	22	37	15	6	9	145	195
Overtime	409	V	10	2	—	2	2	4	31	41
Lost time	410	S	2	2	5	3	—	3	22	121
Scrap	411	V	80	18	18	—	—	—	241	—
Rectification	412	V	10	2	1	1	2	3	51	31
Consumable stores	430	V	16	4	11	7	2	5	44	56
Maintenance	440	V	44	10	71	61	5	56	132	148
TOTAL EXPENSE	—	—	240	74	159	85	21	64	886	761
TOTAL	—	—	—	374	553	179	185	6	4,223	2,536

* V = Variable
S = Semi-variable

Statement No. 5

STATEMENT No. 6

EXPLANATORY NOTES

This statement is used to control all works expense which is not directly allocatable to, or controlled by, one cost-centre but which is the responsibility of the works manager.

The figures in the first sterling column are the normal budget of expense under each heading calculated on the basis of a normal level of factory activity for the period. The figures in the second sterling column show the allowed cost calculated from flexible budgets for each item of expense, having regard to the actual level of activity and efficiency achieved. In the third sterling column, the actual costs incurred during the period are shown. In the subsequent columns the variances are analysed for each item of expense between losses due to the low efficiency of the factory and variations between actual cost (after taking those losses into account) and allowed cost.

Statement No

GENERAL WORKS OPERATING STATEMENT

DEPARTMENT G.W.

	This Period	To Date
ACTIVITY ..	46	40
EFFICIENCY ..	77	70

PERIOD No. 7
ENDING 20th December, 194

Account	Account No.	Control basis *	Normal budget	Allowed cost	Actual cost	Controllable variance	Variance analysis: Efficiency	Variance analysis: Expenditure	Accumulation for 7 Periods: Allowances	Accumulation for 7 Periods: Variances
			£	£	£	£	£	£	£	£
Supervision	402	F	98	98	98	—	—	—	1,082	42
Service labour	404	F	3	3	2	1	—	1	63	[illegible]
Cleaning	405	F	25	25	20	5	—	5	220	7
Warehousing	406	S	148	120	58	62	[illegible]	72	1,051	[illegible]
Stores	407	S	63	59	51	8	[illegible]	11	393	[illegible]
Scrap	411	V	18	8	19	[illegible]	[illegible]	[illegible]	123	[illegible]
Consumable stores	430	S	10	8	7	1	—	1	71	[illegible]
Maintenance	440	S	232	157	180	[illegible]	[illegible]	2	1,336	[illegible]
Light and power	446	V	108	46	46	—	[illegible]	14	424	—
Works office	450	S	229	213	222	[illegible]		[illegible]	1,829	[illegible]
Holiday pay	453	S	73	77	77	—	—	—	718	—
Carriage	455	V	48	21	113	[illegible]	[illegible]	[illegible]	500	[illegible]
National insurance	464	S	60	60	57	3	—	3	604	52
Stationery	469	F	36	36	20	16	—	16	362	158
Dining and welfare	447	S	102	57	78	[illegible]	[illegible]	[illegible]	833	251
Packing material	488	V	68	29	30	[illegible]	[illegible]	7	266	4
TOTAL	—	—	1,321	1,017	1,078	[illegible]	[illegible]	26	9,875	[illegible]

* F = Fixed
V = Variable
S = Semi-variable

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(References throughout are to marginal paragraph numbers)